

# **INCORPORATING DEMAND RESPONSE INTO REGIONAL TRANSMISSION PLANNING IN THE MIDWEST**

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**Dr. Ronald R. McNamara  
Vice President of Market Management**

Good Afternoon. Thank you for giving me this opportunity to address demand response initiatives and transmission planning within the Midwest ISO.

## **TRANSMISSION PLANNING AT THE MIDWEST ISO**

Transmission Planning at the Midwest ISO is produced in accordance with the requirements of RTO regional planning as set forth in FERC Order 2000, and with the agreement among the Midwest ISO and the Midwest ISO Transmission Owners. As part of the ongoing responsibilities of being a Transmission Provider, the Midwest ISO develops transmission expansion plans to address the reliability of the Transmission System that is under its operational and planning control. In addition, the transmission plan needs to identify system expansion options that are beneficial in supporting the competitive supply of electric power by this system. This process should consider all market perspectives, including demand-side options, generation location, and transmission expansion alternatives. To date the Midwest ISO has produced two Midwest Transmission expansion Plans (2003, 2005). Each study is a bottom-up, top-down approach that provides both detail at the local level and analysis and optimization at the RTO level. Each study used an open planning process that provided an opportunity for inputs from all stakeholder groups. Finally, it was discussed with the Organization of Midwest ISO States (OMS) and with the Advisory Committee of the Midwest ISO before being brought before the Midwest ISO Board of Directors for approval.

## **TWO SIMPLE TRUTHS**

After describing the Midwest ISO's planning process, let's acknowledge two simple truths. First, it's impossible to assess the reliability or economic optimality of a transmission system without also forecasting future load additions, generation additions

and retirements, and finally the growth in demand response. Unlike transmission system modifications, however, these factors ARE market-driven, in that load growth, generation investment and demand response initiatives respond to expected future electric energy prices. Prices matter! For this reason any transmission planning process must take into account the long-run price responsiveness of generation and demand growth, including flexible load.

A second truth is that, with a few exceptions, power system reliability cannot be assessed for any individual region without taking account of what is likely to happen in the other regions to which it is interconnected. This implies the need for coordination among the ISOs/RTOs and non-ISO entities within the Eastern Interconnect. It also suggests the need for developing a common “Base Case” of load flows that is quantified in a database available to planning entities. This appears to be an appropriate role for the Electricity Reliability Organization (ERO) created by the EPAct of 2005.

Now let me briefly describe how the Midwest ISO planning process is critically linked to our proposed resource adequacy construct.

#### **THE PROPOSED MIDWEST MARKET DESIGN FOR RESOURCE ADEQUACY**

The Midwest ISO has developed a “white paper” describing the elements and merits of an “energy-only” market that will pay resources (generation and demand response) for the energy and ancillary services they produce but not for their available capacity.<sup>1</sup>

Typically, such a market can have higher energy prices than those in markets that impose lower price caps on energy, which in turn creates the need for capacity payments. The Midwest ISO has indicated it has a strong preference for implementing the key elements of this pricing approach. As explained in this White Paper, the basic elements of this resource adequacy approach serve two very important and related purposes:

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<sup>1</sup> Midwest ISO, “An Energy-Only Market for Resource Adequacy in the Midwest ISO Region,” November 23, 2005. This document is posted on the Midwest ISO website, [http://www.midwestmarket.org/publish/Document/2220c2\\_108155d446d\\_-7a9e0a48324a?rev=1](http://www.midwestmarket.org/publish/Document/2220c2_108155d446d_-7a9e0a48324a?rev=1).

*The short-run reliability function:* This “reliability through markets” approach uses “shortage-cost” pricing to determine the clearing price for energy and operating reserves when all energy and operating reserves requirements cannot be met in the Midwest ISO’s real-time (and day-ahead) markets. The resulting spot market prices provide the correct price signals to generators and price-responsive demand to take all reasonable efforts to ensure that the ISO dispatch can keep the lights on in real time. When shortages exist, generators faced with such prices have strong incentives to respond by making their plants available for dispatch and price-responsive loads have strong incentives to reduce demand. Both of these responses will limit the extent of the price increases, mitigate market power and reduce the likelihood and duration of shortages that might require involuntary curtailments (rotating blackouts).

*The long-run resource adequacy function:* In this framework, the same short-run clearing prices that keep the lights on in real time also send the correct price signals to support an efficient level of investment over time, as well as the correct price signals to encourage an appropriate mix of resources, including demand response.

It is important to distinguish these two related functions. There is no dispute that one of the principal responsibilities of the Midwest ISO is to ensure moment-to-moment reliability. The ISO’s job in implementing its security-constrained, economic dispatch is to keep the lights on at all times and to minimize the cost by selecting the most economic units to dispatch. In a market framework, in which resources are owned by many independent entities and thus respond to market price signals, getting these clearing price signals right is therefore essential to keeping the lights on in real time.

To successfully and consistently perform this vital reliability function, the Midwest ISO is therefore convinced that it should implement the elements of this “reliability through markets” approach, based on its belief that this is the best approach for ensuring short-run reliability. There appears to be ample experience in ISOs/RTOs elsewhere to indicate that failing to get the short-run price signals correct undermines reliable dispatch, fails to encourage generators to make all reasonable efforts to make their plants available for

dispatch, and requires an increasingly complex set of administrative rules to overcome the wrong incentives and to induce behavior consistent with reliable operations.

### **BACK TO THE TWO SIMPLE TRUTHS**

This “reliability through markets” approach may allow smaller generation reserve margins by relying on price responsive demand to maintain power system reliability.<sup>2</sup> It allows the larger commercial and industrial customers to choose how much service reliability they are willing to pay for while providing lower cost electric service for all customers. The Transmission Expansion Plan and its expected investment in generation and demand response should reflect the expected path of this “shortage cost” pricing.

The second truth suggest that seams issues in adjoining RTOs due to varying market designs should be accounted for. We can expect market participants to attempt to arbitrage differences in energy prices across RTOs; in some cases this is a simple example of efficient economic exchange, not of “free-riding.” An integral part of our transmission planning process will be to coordinate planning and operational designs across adjoining RTOs. We are currently examining any issues related to our resource adequacy proposal as part of a “seams” study we are jointly conducting with PJM.

### **IMPORTANCE OF PRICE RESPONSIVE DEMAND AND OTHER DEMAND RESOURCES**

The success of our “energy-only” market approach will critically depend on getting a threshold amount of price responsive demand on line within our footprint in the next several years. The potential clearly exists. All that is needed are the right economic incentives, which we have identified in our White Paper. At the current time the Midwest ISO believes its proposed market design obviates the need for any special side payments to promote demand response. Getting the energy market prices correct should be enough. Demand response can avoid investments in peaking generation used to serve demand that occurs a few hours per year.

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<sup>2</sup> As used here, power system reliability means the loss of load expectation of the loads that are not price responsive. Clearly it is possible to achieve the same loss-of-load expectation (LOLE) for such loads with much smaller reserve margins if a significant portion of the total load voluntarily decreases in response to high spot energy prices.

Demand response can also provide short-term reliability benefits. Selectively curtailing service to customers that place lower values on loss of service and voluntarily elect to participate in an emergency demand response program is more cost effective and efficient than random rolling outages.

In addition, enhancements to the transmission expansion planning process could support the goals of our market design and in addition alleviate concerns of the stakeholder community regarding resource adequacy.

#### **AN ADDENDUM TO THE MIDWEST TRANSMISSION PLANNING PROCESS**

The Midwest ISO is currently investigating a process to produce annually a Base Case scenario that forecasts out five years or more all power flows and hourly LMPs on our transmission system. The need for forecasting LMPs is necessary because they directly drive how much new load and generation there will be and where they are likely to locate. It is also necessary for assessing the economic attractiveness of one alternate transmission upgrade scenario over another.

When the Base Case scenario is completed alternate scenarios can also be produced, that vary load growth and fuel prices to determine how robust the Base Case transmission investment scenario is to changes in these factors. This assessment will include similar assessments of alternate investment scenarios aimed at improving on the Base Case.

At the end of each planning cycle the results can be published and can be used to inform state regulators whether the load-serving entities (LSEs) under their jurisdiction have any shortcomings (e.g., sufficient contract cover), or whether potential improvements could be made to the individual LSE resource plans. As a result of efforts like these, no market participant or regulator having jurisdiction over that participant should be caught by surprise regarding the short or long positions of buyers or sellers in the wholesale energy markets.